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## Evaluation of biodiversity of termites and wood-decaying fungi in tropical plantation forests

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Tropical forests contain the highest biodiversity in the world. Conserving biodiversity is crucial to maintain ecosystem services, which benefit human well-being. But tropical rain forests are still decreasing for many purposes; cutting for timber, oil-palm plantation, *Acacia* plantation for pulp production, shifting cultivation, *etc*. These changes in land-use caused habitat loss and even extinction of many organisms. The most important threats to mono-cultural plantation forests are disease and pests caused by other organisms, such as microorganisms and insects. In natural forests, the threats are likely to be secured by biological diversity. Therefore, the biodiversity of the plantation forests must be key information to evaluate the sustainability of the forest management. The strongest impact on decreasing ecosystem services in tropical rain forest is habitat loss. Maintaining biodiversity requires adequate landscape structure or management procedure. Our objective is to clarify termite and wood-decaying fungi diversity in plantation and conservation forests with different disturbance intensity. Termites and wood-decaying fungi are most important organisms that can convert lignocelluloses into low-molecular substrates, and are known to be good indicators of the forest soundness. We would like to clarify faunal and floral differences along with tree ages and distance from conservation forest as a species source to discuss what plantation should be to maintain ecosystem services.

The survey sites and protocols are as follows:

Borneo Island: *Acacia* Hybrid mono-cultural plantation forests and conservation forests near Keningau, Sabah, Malaysia.

Vietnam: *Acacia* Hybrid mono-cultural plantation forests in Tan Lap and conservation forests at Cat Tien National Park.

For the termite survey, the standardized protocol of a belt-transect method is applied. A 2 m x 100 m belt-transect is divided into 40 sub-transects (1 m x 5 m), and the one sub-transect is surveyed for termite fauna by a single people for 30 min (Fig. 1). All termite samples are kept in EtOH and brought back to Japan for identification. Four 4 m x 60 m belt-transects perpendicular to the 100 m termite belt-transect are subjected to the quantitative survey of wood-deteriorating fungi. A 60 m x 100 m arena is also surveyed for the total faunal assemblage. All fruiting bodies of wood-decaying fungi from the belt-transect and the arena are collected and dried, and brought back to Japan to be identified.

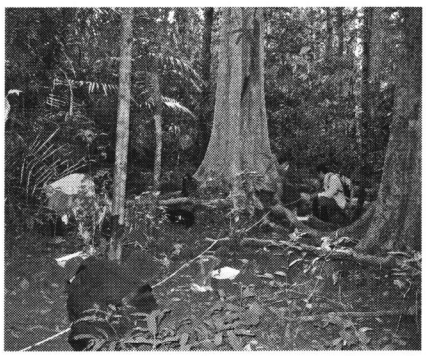

Figure 1. The belt-ransect termite survey in Cat Tien National Part, Vietnam.

Results obtained for the last two years show that termite fauna and wood-deteriorating fungal flora are strongly affected by mono-cultural plantation. Comparing the termite fauna among the sites, the age of plantation does not have significant positive effect on species richness, whereas the termite biomass is increased with the age. The plantation sites and the conservation sites have completely different fungal flora, and it is estimated that 20-30 years are not long enough to recover the original fungal flora in the plantation sites.

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